Power distribution system
unimes H

Manual
U-MUN
module enclosure univers N

hager

Table of contents

1 About this manual 4
- 1.1 Subject of the manual 4
- 1.2 Observe related documents 5
- 1.3 Storing the documents 6
- 1.4 Imprint 6
- 1.5 Warranty and Liability 7
- 1.6 Uses symbols and trademarks 8
- 1.7 Abbreviations 10

2 Safety information 11
- 2.1 Observing the safety information and instructions 11
- 2.2 Intended use of U-MUN 12

3 Technical data 13
- 3.1 Main busbar system M-BB 13
  - 3.1.1 Electrical features of the M-BB 14
  - 3.1.2 Mechanical features of the M-BB busbar 15
  - 3.1.3 M-BB according to the type of the earth connection 15
- 3.2 Module enclosure univers N 16
  - 3.2.1 Characteristic features of module enclosure 16
  - 3.2.2 Electrical data for U-MUN 17
  - 3.2.3 Electrical data for F-BB UST4 17
  - 3.2.4 Cross-connection space / auxiliary power circuit cabling 18

4 About the module enclosure 19
- 4.1 Application and version of the module enclosure 19
- 4.2 Type key 20
- 4.3 Front versions 20
- 4.4 Important characteristics U-MUN 21
- 4.5 Expansion examples 22
- 4.6 Overview of installation options 23
- 4.7 Component overview 23
- 4.8 Internal construction 25

5 Control and operation 27
5.1 Personnel requirements 27
5.2 Operating protective devices under loads 28
5.3 Take the system manual for the power distribution system into account 29
5.4 Observing device and component manuals 29

6 Glossary 30

7 Index 33

1 About this manual

Cabinet system component

This manual for the U-MUN module enclosure univers N forms part of the unimes H power distribution system.

Introductory information

The "About this manual” section provides introductory and general information about the manual. The symbols and abbreviations used in the manual are explained.

1.1 Subject of the manual

This document is intended for users of the U-MUN module enclosure univers N: Planners, manufacturers, operators and users of power switchgear combinations in accordance with EN 61439-1/-2.
The module enclosure forms part of the unimes H power distribution system.

Objective

This manual describes the design, function and applications of the module enclosure. It conveys important information which is the prerequisite for safely operating and performing work on the module enclosure within the enclosure system. This manual must be read in combination with the unimes H system manual.

The manual contains information about the efficient use of the module enclosure as well as

- the intended use, technical data,
- installation, operation, interior fittings and assembly.

Please further consider the system manual for the unimes H power distribution system. The system manual informs regarding the efficient use of the enclosure system and provides clues regarding

- about safe transport,
- about safe assembly,
- about safe installation,
- about safe commissioning,
- about safe operation,
- about safe repair and maintenance,
- about safe decommissioning and disassembly.

1.2 Observe related documents

In addition to this manual, the following documents form an integral part of the documentation. The instructions and information contained in them must always be observed:

For the operator:

- unimes H power distribution system manual.

For the planner:

- unimes H power distribution system manual
- Manuals / instructions for the univers N internal extension system
- Hager catalogues for power distribution systems with technical information
- Component selection, lists and production drawings from the Wecom planning software
- Guidelines for project planning and design of switchgear according to DIN EN 61439 (VDE 0660-600)

For the switchgear manufacturers / electrical engineers

- unimes H power distribution system manual
- Assembly instructions for enclosure components
- Manuals / instructions for the operating equipment
- Manuals / instructions for the univers N internal extension system
- Component selection, lists and production drawings from the Wecom planning software
- Guidelines for project planning and design of switchgear according to DIN EN 61439 (VDE 0660-600)
- Record for routine verification (routine test report)
- Checklist for the conformity assessment procedure

For the electrical engineers

- unimes H power distribution system manual
- Manuals / instructions for the univers N internal extension system
- Manuals / instructions for the operating equipment

1.3 Storing the documents

The manual is an integral part of the cabinet system.

- Carefully read through this manual and the system manual for the unimes H power distribution system before performing work on the cabinet system.
- In particular, read and observe the section "For your safety" and the safety measures in additional sections.
- Store the manuals at the operating site of the cabinet system. The authorised personnel must have access to the manuals at all times.
- The operator is responsible for storing the documents.

1.4 Imprint

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Revisions

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unimes H U-MUN module enclosure univers N manual

Revision number	Date	Name	Item number
1.1	10/2018	F. Hauser, R. Thiex	473-784-132

1.5 Warranty and Liability

The manual does not extend the Sales and Delivery Conditions of Hager. No new claims concerning the warranty and guarantee, which extend beyond the Sales and Delivery Conditions, can be derived from this manual.

Liability note

Hager reserves the right to modify or supplement the product or the documentation at any time without prior notice. Hager assumes no liability for typographical errors and any damage which may arise from them.

1.6 Uses symbols and trademarks

Warnings

Warnings warn you about dangerous situations.

⚠ DANGER
DANGER indicates an instruction that, if not observed, results in death or serious personal injury.

⚠ WARNING
WARNING indicates an instruction that, if not observed, may result in death or serious personal injury.

⚠ CAUTION
CAUTION indicates an instruction that, if not observed, may result in personal injury.

Structure of warnings

⚠ DANGER
Type and source of the danger! Consequences if the danger is ignored ➢ Measures for averting the danger

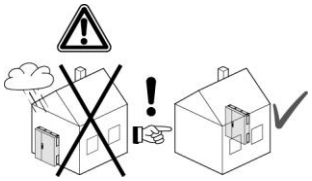
Warning of property damage

Some instructions that must be adhered to in order to avoid property damage have been highlighted:

NOTICE
ATTENTION indicates a warning of property damage. *ATTENTION* also indicates important user instructions and particularly useful information about the product that requires particular attention by the user.

Used symbols

The following symbols are used in this manual and in the assembly instructions:

<table>
<tr><th>Symbol</th><th>Meaning</th></tr>
<tr><td>  </td><td>The work must only be performed by an electrically skilled person.
  
Electrically skilled person: Only voltage-free work permitted
Electrically skilled person: Live work permitted</td></tr>
<tr><td>  </td><td>The product is intended for indoor installation or indoor use.</td></tr>
</table>

Procedural instructions:

Procedural instructions with a fixed order are displayed in clearly arranged tables:

Step	Action
1	Procedural instruction step 1
2	Procedural instruction step 2
3	Procedural instruction step 3

Additional symbols and their meaning:

Visual representation	Meaning
1., 2., 3., etc.	Numbered lists
-	Lists and procedural instructions without a fixed order
-	Lists and procedural instructions without a fixed order in the 2nd level
➢	Measure / procedural instruction for averting danger

1.7 Abbreviations

Abbreviations used

Abbreviation	Description
EFM	English: Electric Fuse Monitoring
EMC	Electromagnetic compatibility
-F	Fixed installation (screwed)
FE	Front installation
FE 1	Front installation level FE1: Installation in fixed front or with (module) door with cut-outs
FE 2	Front installation level FE2: Front installation with cover plate (without door)
F-BB	Distribution busbar system, field busbar system
GF	Glass fibre bar
gG	Fuse operating class: Full range protection, standard type for general use
Sz.	Size
HF	Installation level HF: Rear front, installation behind door
M-BB	Main busbar system, busbar system
ME	Module unit
ModBus	Communication protocol
NH-S	Low-voltage high-power fuse
PC	Polycarbonate
PZ...	Pozidrive® (screwdriver type) ... (Size)
RAL	Standardised colour collection with four-digit colour numbers
RDF	Rated diversity factor
SAB	Switch system manufacturer
BB	Busbar system
SK	Switchgear and controlgear assembly
SK I / SK II	Protection class I / II
TA	Partial extension
U-	unimes H
VA	Full extension
VDE	Verband der Elektrotechnik, Elektronik und Informationstechnik e. V. [Association for Electric Technology, Electronics and IT]

2 Safety information

Read carefully

- The safety information in the system manual for the unimes H power distribution system should also be taken into account.
  The safety-related information is provided to help you identify and avoid risks in good time. It is the prerequisite for safe assembly and use of the cabinet system. The information about intended use as provided in this chapter should also be taken into account.

Observe the univers N catalogues and instructions

- Observe the catalogues and instructions for the univers N internal extension system.

2.1 Observing the safety information and instructions

Read and take note of the chapter "For your safety" in the system manual for the unimes H power distribution system.

Also take note of the safety information provided in other chapters.

Adherence to the safety information is a precondition for the safe use of the cabinet system.

Read and observe the Hager catalogues and instructions for the univers N internal extension system.

Observing the information is a prerequisite for safe use in the univers N module enclosure within the unimes H power distribution system

2.2 Intended use of U-MUN

The U-MUN module enclosure univers N forms part of the unimes H power distribution system. The unimes H power distribution system is a type-tested switchgear and controlgear assembly for switchgear and controlgear assemblies according to EN 61439-1/-2/-5.

The U-MUN module enclosure univers N is designed for installing kits and components of the univers N / univers N HS internal extension system.

The U-MUN module enclosure is suitable for routing the M-BB main busbar system and can be used in incoming unit applications up to 1600 A and cable outlet applications up to 1600 A.

The U-MUN module enclosure is intended for fixed indoor installation. It is permanently installed and operated in a closed electrical operating compartment at the installation site. If the module enclosure is not operated in a closed electrical operating site, switching operations and access to the open switching enclosure by unauthorised personnel must be prevented. The module enclosure must then be lockable using a lock or tools must be required to open it. Further information is provided in the "Technical Data" chapter in this manual and in the system manual for the unimes H power distribution system.

The units may not be serviced or operated by an unqualified person.

Intended use also includes:

- Reading and observing the manual and system manual,
- Compliance with the safety regulations.

Misuse

Any other or additional use is considered misuse. Hager does not assume any liability for damages resulting from misuse.

Danger due to electric shock or arc faults in case of misuse!

Misuse of the module enclosure can result in dangerous situations due to high voltages and high currents. This may result in serious injuries and even death.

- Avoid use in areas for which the product has not been designed.
- Never operate the product outside the specifications as provided in the Technical Data.
- Observe the instructions for extension and the upscaling regulations.
- Always observe the requirements for personnel qualifications.

3 Technical data

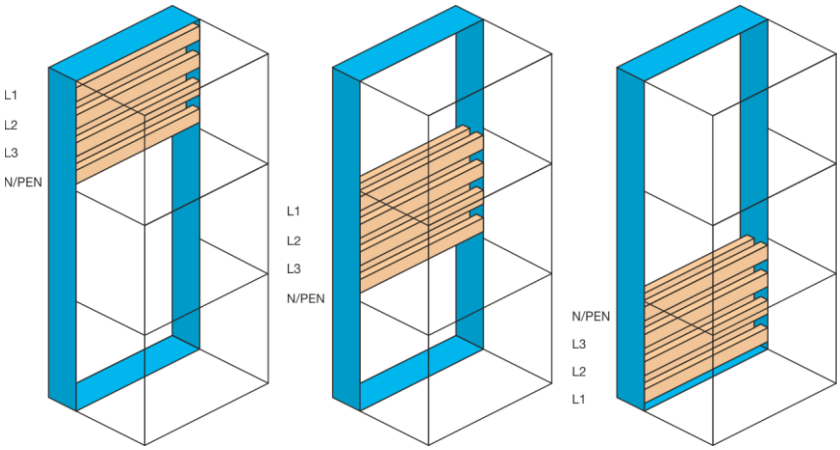
Important for intended use

Observing the technical data is important for ensuring the intended use.

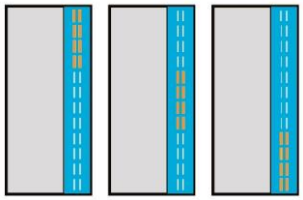
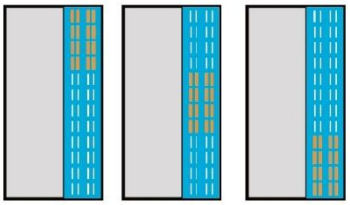
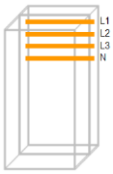
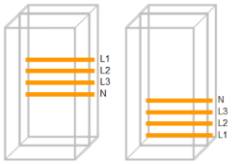
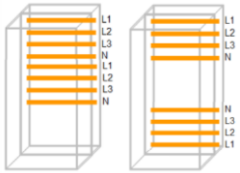
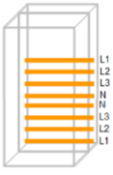
3.1 Main busbar system M-BB

The main busbars can be positioned at 3 different heights on unimes H. You can position the main busbars at the bottom, in the middle or at the top.
This makes it possible to install up to 3 main busbar systems (M-BB) in the enclosure. 2 main busbar systems may be loaded simultaneously here. Flexible positioning of the M-BB in the enclosure makes it possible to change the position of the main busbar system without any space loss on the side (via a coupling enclosure U-TK). The connection to the M-BB without drilling and short connection paths also enable a reduction in the copper requirements and time-saving assembly.

3 positions of the M-BB: Phase positions



3.1.1 Electrical features of the M-BB

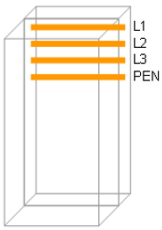
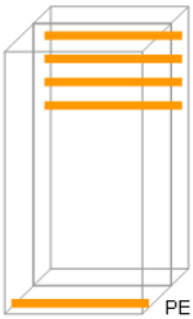
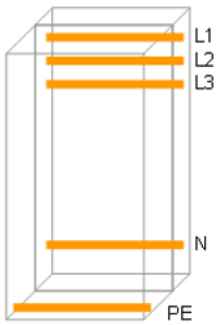
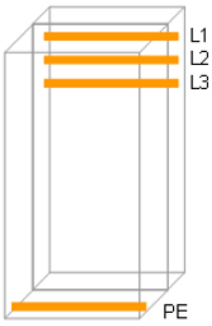
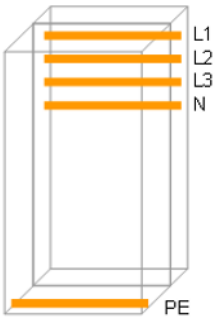
M-BB positions (side view of enclosure)		
Rated current per rail system initial feed	≤ 2950 A	≤ 4000 A
Enclosure depth	600 mm	800 mm
Rated current I_{nA} M-BB top 	Cu 2x30x10 ≤ 1250 A Cu 2x40x10 ≤ 1600 A Cu 2x60x10 ≤ 2000 A Cu 2x80x10 ≤ 2850 A	Cu 4x60x10 ≤ 3200 A Cu 4x80x10 ≤ 4000 A
Rated current I_{nA} M-BB centre / bottom  (M-BB centre / bottom)	Cu 2x30x10 ≤ 1250 A Cu 2x40x10 ≤ 1600 A Cu 2x60x10 ≤ 2000 A Cu 2x80x10 ≤ 2950 A	Cu 4x60x10 ≤ 3200 A Cu 4x80x10 ≤ 4000 A
Rated current I_{nA} 2x M-BB: - Top / centre - Top / bottom 	2x M-BB: Cu 2x30x10 ≤ 1250 A Cu 2x40x10 ≤ 1600 A Cu 2x60x10 ≤ 2000 A Cu 2x80x10 ≤ 2500 A	2x M-BB: Cu 4x60x10 ≤ 3200 A Cu 4x80x10 ≤ 4000 A
Rated current I_nA 2x M-BB: Centre / bottom 	2x M-BB: Cu 2x30x10 ≤ 1250 A Cu 2x40x10 ≤ 1600 A Cu 2x60x10 ≤ 2000 A Cu 2x80x10 ≤ 2600 A	2x M-BB: Cu 4x60x10 ≤ 3200 A Cu 4x80x10 ≤ 4000 A

Other features: See unimes H system manual / type certificate

3.1.2 Mechanical features of the M-BB busbar

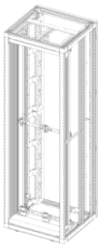
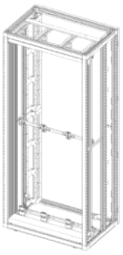
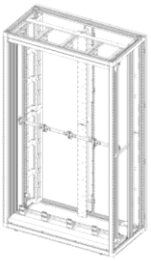
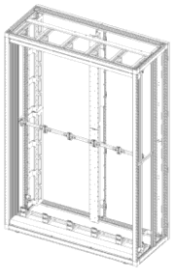
Busbar arrangement	Cabinet rear
Busbar installation position	Horizontal
Material	Flat copper Cu-ETP-R240
Bar support arrangement and cross-section [mm]	II 2x30x10 II II 4x60x10 II 2x40x10 II II 4x80x10 II 2x60x10 II 2x80x40
Distance between phases	150 mm
Max. distance between supports	660 mm: Standard I_{cw} values on busbar 330 mm: increased I_{cw} values on busbar with GF fibre glass bars
Distance between sub-conductors	22 mm suitable for M12 (air distance 12 mm)
Bar connections	No holes, via M12 screws
Busbar connector type	Compact transport divider U-TTK or Cu tabs with screw connections (U-TT)
Busbar connector access	Enclosure front (U-TT / U-TTK) Enclosure rear (U-TTK)

3.1.3 M-BB according to the type of the earth connection

TN-C	TN-S	IT	TT
	 		
Overview of the busbar guide according to the type of low-voltage network / type of the earth connection			

3.2 Module enclosure univers N

3.2.1 Characteristic features of module enclosure

					
Enclosure width [mm]	600	850	1100	1350	1350
Door width [mm]	600	850	1100	550 + 800	800 + 550
Max. extension width Number of module units [250 mm]	500 2	750 3	1000 4	1250 5	1250 5
Enclosure height [mm]	2000 / 2200 (specifications without pedestal)				
Max. extension height Number of module units [150 mm][1]	1800 mm with enclosure height of 2000 mm 1950 mm with enclosure height of 2200 mm 12 with enclosure height of 2000 mm 13 with enclosure height of 2200 mm				
Enclosure depth I_n M-BB ≤ 2950 A I_n M-BB ≤ 4000 A	 600 mm 800 mm				
Device installation technology	Plug-in connection FFF, FFD				
Mountable devices	Modular devices / NH devices				
Device operation	Can be operated from behind the door: Device-dependent				
Ventilation	Forced convection without additional ventilation				
Max. protection type	IP40 (enclosure closed)				
Form of internal separation	1, 2b				
Enclosure colour	RAL 7035 / RAL of choice / 2 colours				
Colour of enclosure rack	Hot-galvanised / RAL of choice				
Front version	Steel plate door (whole door), glazed door (on enclosures with a width of 1350 mm, the doors are asymmetrical)				

[1]for univers N: 1 ME module height = 150 mm, module width = 250 mm

3.2.2 Electrical data for U-MUN

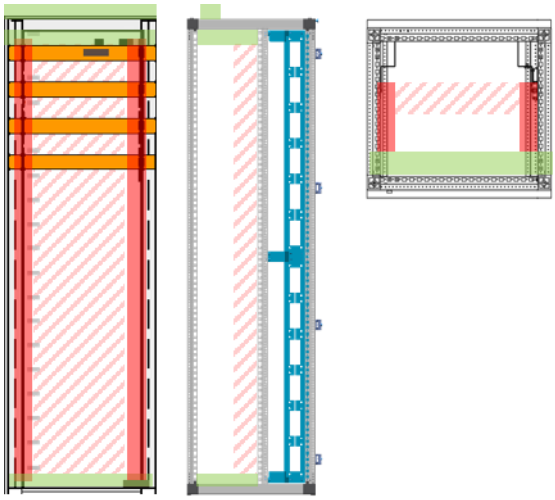
Electrical data

Physical parameters		**Size**	**SI unit**
Rated current of distribution busbars	I_n	Up to 1600	A
Rated conditional short-circuit current	I_{cc}	According to assemblies	
Rated short-term current (1 s)	I_{cw}	According to assemblies	
Rated surge current resistance	I_{pk}	According to assemblies	

3.2.3 Electrical data for F-BB UST4

Rated current [A]	400
Bar cross section [mm]	1x20x10
Number of field distribution busbar systems per device compartment	1
Installation position UST4	Horizontal
Terminal conductor spacing [mm]	50
Rated short-term resistance current I_{cw} [kA]	65 kA at 440 V 65 kA at 690 V
Max. permissible support spacing [mm]	380 mm
Network types	TN-S / TN-C / TN-C-S / TT / IT

3.2.4 Cross-connection space / auxiliary power circuit cabling



From the front | Side view | Top view

- The vertical auxiliary power circuit can be routed along the corner supports (on the left and right of the device compartment).
- The preferred horizontally routed auxiliary power circuit should be routed under the enclosure roof or floor (instead of the PE).
- The PE and auxiliary power circuits should be routed separately.

The PE must be routed in front and the auxiliary power circuit in the back when PE and auxiliary power circuit cannot be routed separately. This ensures that the auxiliary power circuit will not collide with the wiring of the installed equipment.

- The horizontal auxiliary power circuit can also be routed along the roof of the switchgear and controlgear assembly enclosure (metal cable conduit on the enclosure roof (cover plate perforated as for 2b partition))
- The equipment auxiliary circuit is exclusively used within the enclosure between the control compartment and the equipment.

Information about auxiliary power wiring / cross-wiring

The auxiliary power wiring / cross-wiring is contained within

- Plastic pipes (KIR, KRH) inside the enclosure,
- plastic cable conduits / grid conduits.

The optional auxiliary power wiring / cross-wiring on the cabinet roof is contained within a metal cable conduit (on a pre-perforated cover plate).

- The cable routing must be adequately dimensioned. This will prevent damage to the insulation when feeding in / replacing cables.
- When selecting the material, take into account external influences such as chemical, mechanical and thermal influences.

4 About the module enclosure

For flexible extension up to 1600 A

The kits and components of the univers N / univers N HS internal extension system offer a wide variety of extension options for the univers N module enclosure within the unimes H power distribution system.

4.1 Application and version of the module enclosure

U-MUN module enclosure univers N

Area of application
- Cable outlets up to max. 1600 A
- Field connection up to max. 1600 A

Design options
- Device installation:
  - univers N internal extension system
  - univers N HS extension system
- Connection type:
  - Cable connection for enclosure roof and enclosure base N offset

A comprehensive range of assemblies are available for extending univers N module enclosures and comprise touch protection cover plates as per DIN 43780, part 2 and a large number of electrical devices from the Hager product range.

Processing time optimised through production drawings

Hager provides the switchgear manufacturer with enclosure type-specific assembly drawings and individual component drawings for producing the individual Cu parts.

- On receipt of the Cu production drawings, the switchgear manufacturer produces the individual Cu parts before the switching cabinets are delivered.
- This optimises the processing time.

4.2 Type key

Standard version (Form 1)

U-MUN type key

U	-	MUN	6 0	8 0	2 0
unimes H		Enclosure type	Enclosure width	Enclosure depth	Enclosure height

4.3 Front versions

Front version, whole door / steel plate door
1-part up to enclosure width of 850 mm
2-part from enclosure width of 1100 mm

Front version, whole door: Glazed door
1-part up to enclosure width of 850 mm
2-part from enclosure width of 1100 mm

4.4 Important characteristics U-MUN

Maximum expansion widths of univers N Module

Enclosure width [mm]	Extension width [mm]	Module widths	Support width
600	500	2 module widths	+100 mm support width
850	750	3 module widths	+100 mm support width
1100	1000	4 module widths	+100 mm support width
1350	1250	5 module widths	+100 mm support width

Maximum expansion heights of univers N Module

Enclosure height [mm]	Extension height [mm]	Module heights	Cover
2000	1800	12 module heights	+200 mm cover
2200	1950	13 module heights	+250 mm cover

Device installation

- Only rear front (HF) possible

Front version

Enclosure width [mm]	Door*
600	Door, 1-part
850	Door, 1-part
1100	Door, 2-part
1350	Door, 2-part (doors are asymmetrical - 850+500 / 500+850)

*Steel plate door (whole door) or glazed door available

Covers

Type	Version
Cover plate	Closed
	with convection
	with univers N module flanges
Floor plate	with brushes

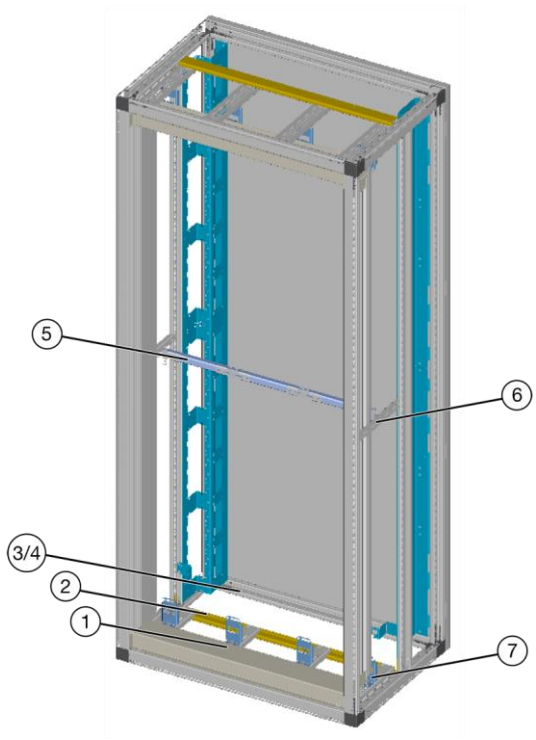
4.5 Expansion examples

4.6 Overview of installation options

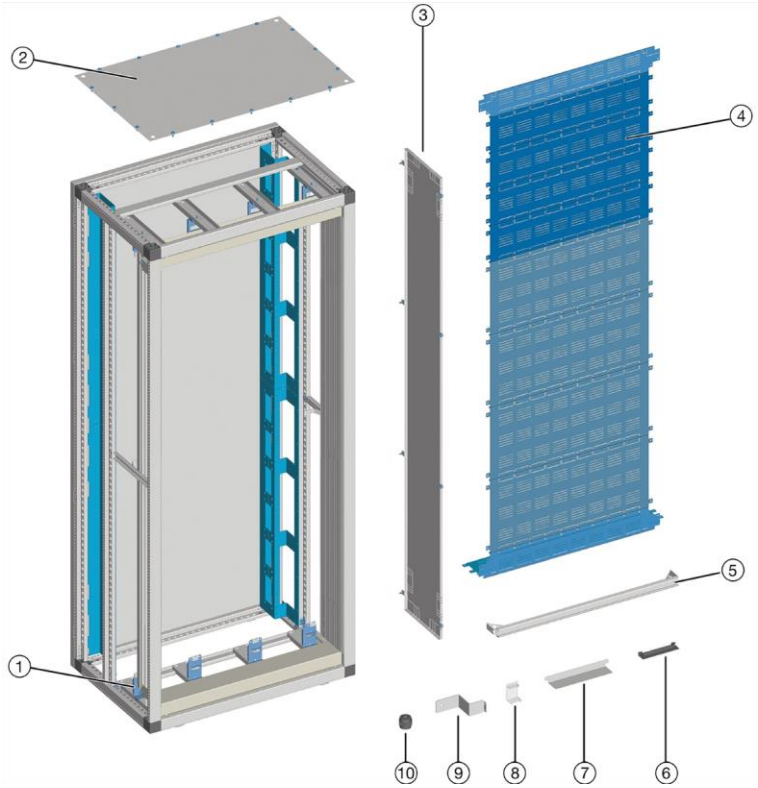
Installation options	
univers N system	- Counter - All devices for DIN and top-hat rails (FI, LS FI / LS, relay, timer, etc.) - MCCB up to max. 1600 A - For all univers N internal extension devices
Control compartment	Assembly plate for control extension, for example
Current busbars	Flexible installation of F-BB UST4
Cable terminal compartment	No predefined terminal compartment (inserted at bottom through floor plate with brushes or at top with cover plate and flanges)
Floor plate	- Without floor plate holder as standard (must be defined in advance with / without floor plate holder) - Floor plate holder for the option of installing floor plates - Existing system with floor plate - New system without floor plate: Compensate for lack of height (2 mm) using the height compensation bracket
Cover plate	Standard with cut-outs for univers N Hager flanges

4.7 Component overview

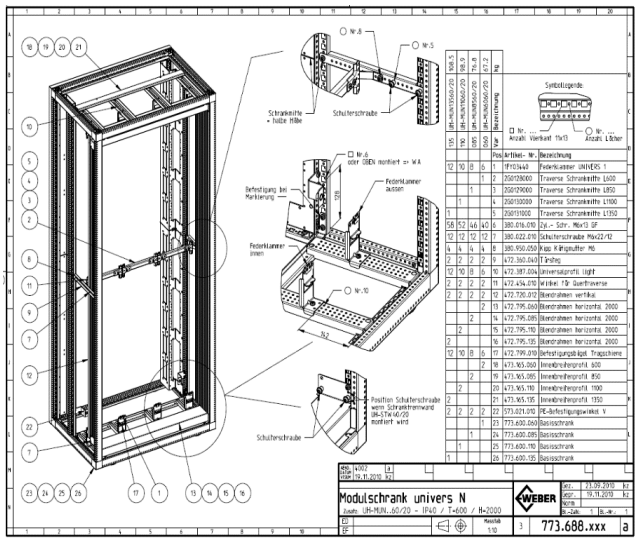
Components for U-MUN outgoing enclosure



1	Horizontal frame cover
2	Internal width profile (widths: 600 / 850 / 1100 / 1350 mm)
3	Central holder for floor plate (for 2b insulation 1100 / 1350 mm)
4	Central depth profile for floor plate (MUN 1100 / 1350 mm)
5	Central enclosure cross-member mounting rail support univers N
6	Door sill
7	Mounting rail attachment bracket for attaching the univers N internal extension system

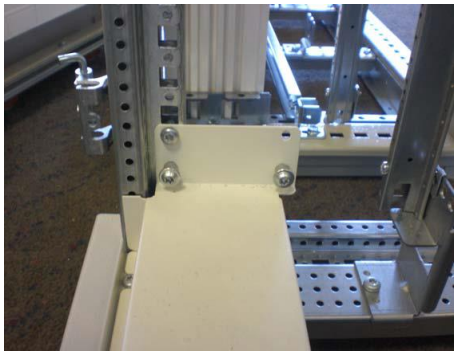


1	Attachment bracket for mounting rail
2	Cover plate (closed here)
3	Lateral field to field partition without main busbar compartment
4	M-BB partition to device compartment and terminal compartment
5	Cable retaining rail including attachment bracket
6	Insulation pieces U-IS for establishing the field connection between the M-BB and F-BB
7 / 8	Blind and access cover
9	N attachment bracket for N/PEN rail on insulators U-SI410
10	Insulator U-SI410

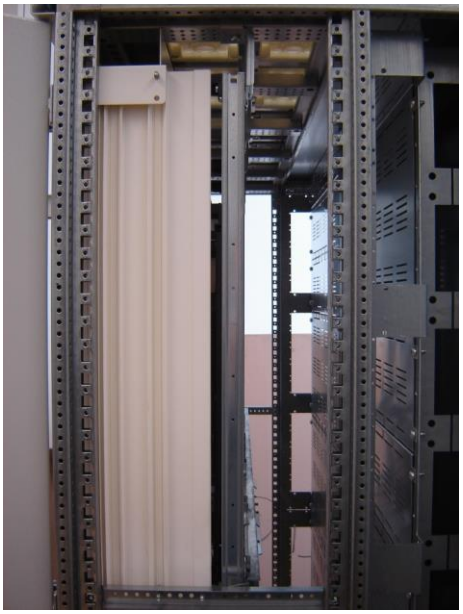


4.8 Internal construction

Example extension (image from front right)



Horizontal frame cover



Vertical frame cover (image of right side)

Cover plate with univers N module flanges

5 Control and operation

No operation by ordinary people

This section provides instructions on operation. Operation of the power switchgear and controlgear assembly by ordinary people is not permitted.

5.1 Personnel requirements

Operation includes all activities that are necessary for the electrical system to function.

This includes:

- Switching,
- Regulating,
- Monitoring,
- Repair and electrotechnical and non-electrotechnical work.

Controlling electrical systems and electrical operating equipment includes activities such as:

- Observation,
- Switching,
- Controlling,
- Regulating,
- Adjusting,
- Monitoring,
- Repair activities.

The electrical system must not be repaired by non-professional electrical personnel. Operating procedures may only be performed on a power switchgear and controlgear assembly:

- By electrically skilled personnel or electrotechnical specialist personnel or
- By electrically instructed personnel (instructed personnel).

To ensure safe system operation, the electrotechnical specialist personnel / electrically skilled person or the electrotechnically instructed person must use suitable tools, depending on the activity. During switching operations, the personal protective equipment (PPE) must be worn.

5.2 Operating protective devices under loads

⚠ WARNING	
	**Risk due to electric shocks, arc faults, burns or explosions. Unauthorised, accidental or careless switching can result in serious accidents. They may result in serious bodily injuries or death.** ➢ Only authorised personnel may perform switching operations. ➢ Prevent access and switching operations by unauthorised personnel. ➢ Suitable protective equipment must be worn for each switching operation. ➢ Switching quickly (in case of disconnectors) ➢ Observe the five essential rules and the five safety rules before and after all work performed on the system.

Switching operations on and operating the NH fuses under voltage/load may only be performed:

- By authorised personnel (electrically skilled person or electrotechnically instructed personnel),
- While wearing protective equipment.

Even if the power distribution system enables switchgear and controlgear assemblies with increased operator protection: Switching operations or operating NH fuse inserts under load or replacing NH fuses are not considered safe work. The NH system is a system intended for use exclusively by authorised personnel. They must be electrically skilled personnel or electrotechnically instructed personnel. Ordinary people may not perform any operations.

Access and switching operations by unauthorised personnel must be prevented and all disconnectors and actuator equipment must be secured against reconnection:

- By effective barriers,
- With padlocks,
- By blocking elements
- And suitable prohibition signs.

Switching operations and the actuation of NH fuses under load are only allowed by authorised personnel if the authorised person:

- Checks the personal protective equipment for visible damage prior to each use,
- Uses a permanently attached cuff for NH uses and NH plug-in grips,
- Wears a suitable helmet with face protection or a flame-retardant hood,
- And wear suitable, flame-retardant and arc-fault-tested work clothing and
- Stands on an insulating mat.

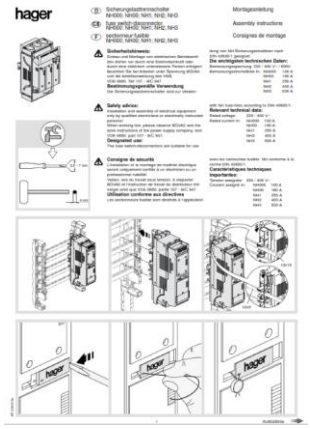
Important: On switches with dependant manual operation, sudden switching operations must be observed by authorised personnel to prevent burn-up hazards.

5.3 Take the system manual for the power distribution system into account

The safety information and instructions in the system manual for the unimes H power distribution system should be taken into account:

- For what to do in case of faults,
- For maintenance,
- For cleaning,
- For inspection and maintenance,
- In case of extension...

5.4 Observing device and component manuals



- Take note of the manufacturer instructions for equipment and components
  (Hager NH fuse switch disconnector instructions are used here as an example)
- Store the manufacturer instructions in an accessible place.

➢ Take note of the instructions of the relevant manufacturer regarding the operation of the respective devices and other components.
➢ Store the manufacturer's instructions in an accessible place.

6 Glossary

Distribution busbar

The distribution busbar is a busbar in a field (therefore also referred to as field distribution bar or field distribution busbar). The distribution busbar is connected to the main busbar via the field connection. The distribution busbar supplies the outgoing units. Conductors, which are connected to a functional unit and a busbar, are part of the distribution busbar.

Distribution busbar (F-BB)

Field busbar system, also known as field distribution busbar system (F-BB). Distribution busbars establish the connection between busbars of the main busbar system (M-BB) and the installed equipment via the field connector. The F-BB distribution busbar system includes the busbar supports (F-BB supports) that contain and position the busbars and fastening and partition accessories in a field.

EN 61439

The EN 61439 standard series replaced the EN 60439 standard series. The EN 61439 standard series has the goal of harmonising the rules and requirements for low-voltage switching equipment combinations.

The valid part of the EN 61439 standard series is always the applicable part of the standard, e.g. EN 61439-2 for energy switching equipment combinations (PSC switching equipment combinations) together with Part 1 of the standard (EN 61439-1).

Connection between European standard and International standard

European standard	International standard	German standard	Classification VDE specifications
EN 61439 (all parts)	IEC 61439 (all parts)	DIN EN 61439 (VDE 0660-600) (all parts)	VDE 0660-600 (all parts)

Parts of EN 61439 standard

Part of European standard	Content
EN 61439-1	Low-voltage switchgear and controlgear assemblies - Part 1: General rules
EN 61439-2	Low-voltage switchgear and controlgear assemblies - Part 2: Power switchgear and controlgear assemblies (PSC)
EN 61439-3	Low-voltage switching controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons
EN 61439-4	Low-voltage switchgear and controlgear assemblies - Part 4: Particular requirements for assemblies for construction sites (ACS)
EN 61439-5	Low-voltage switchgear and controlgear assemblies - Part 5: Assemblies for power distribution in public networks

Part of European standard	Content
EN 61439-6	Low-voltage switchgear and controlgear assemblies - Part 6: Busbar trunking systems (busways)
EN 61439-7	Low-voltage switchgear and controlgear assemblies - Part 7: Assemblies for specific applications such as marinas, camping sites, market squares, electrical vehicles charging stations

Supplements for parts of the EN 61439 standard

Part of European standard	Content
EN 61439-1 Supplement 1	General rules: Guidance to specifying assemblies
EN 61439-1 Supplement 2	General rules: A method of temperature-rise verification of low-voltage switchgear and controlgear assemblies by calculation
EN 61439-2 Supplement 1	Power switchgear and controlgear assemblies: Guide for testing under conditions of arcing due to internal fault

Functional unit

As part of a switchgear and controlgear assembly, a functional unit is used to fulfil the same function. The functional unit contains all the electrical and mechanical components, including switchgear that fulfils the same function.

Conductors that are connected to a functional unit but are located outside the compartment or the area protected by the housing is not considered a part of the functional unit. An enclosed field or space is also referred to as a compartment. The compartment can have openings used for connection, control or ventilation purposes.

Main busbar system (M-BB)

Multi-pin busbar system that is routed in the cabinet of a switchgear and controlgear assembly. The main busbars are routed to the power distribution system via busbar support U-FST.. in the enclosure back. The main busbars of the enclosures of the power distribution system unimes H are connected via transport divider plates U-TT (U-TTS as a set) or the compact transport divider U-TTK. Distribution busbars can be connected to the main busbars. Alternative or additional incoming units or outgoing units can be connected to the main busbar.

Type of electrical connection of functional units

The user can specify the electrical connection of functional units within the switchgear combination. A three-digit code identifies the type of electrical connection of the functional unit:

- 1st letter: Feeding the main circuit to the functional unit
- 2nd letter: Outlet of the main power circuit from the functional unit
- 3rd letter: Connection of auxiliary power circuits

The following letters stand for the relevant type of connection:

- F: For fixed connections,
- D: For releasable connections,
- W: For guided connections.

A functional unit with the code allocation FFD has, for example, fixed feed connections, fixed outlet connections and releasable auxiliary circuits.

7 Index

A

Abbreviations • 10
About the module enclosure • 19
About this manual • 4
Application and version of the module enclosure • 19

C

Characteristic features of module enclosure • 16
Component overview • 23
Control and operation • 27
Cross-connection space / auxiliary power circuit cabling • 18

D

Distribution busbar • 30
Distribution busbar (F-BB) • 30

E

Electrical data for F-BB UST4 • 17
Electrical data for U-MUN • 17
Electrical features of the M-BB • 14
EN 61439 • 30
Expansion examples • 22

F

Front versions • 20
Functional unit • 31

I

Important characteristics U-MUN • 21
Imprint • 6
Intended use of U-MUN • 12
Internal construction • 25

M

Main busbar system (M-BB) • 31
Main busbar system M-BB • 13
M-BB according to the type of the earth connection • 15
Mechanical features of the M-BB busbar • 15
Module enclosure univers N • 16

O

Observe related documents • 5
Observing device and component manuals • 29
Observing the safety information and instructions • 11
Operating protective devices under loads • 28
Overview of installation options • 23

P

Personnel requirements • 27

S

Safety information • 11
Storing the documents • 6
Subject of the manual • 4

T

Take the system manual for the power distribution system into account • 29
Technical data • 13
Type key • 20
Type of electrical connection of functional units • 31

U

Uses symbols and trademarks • 8

W

Warranty and Liability • 7

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